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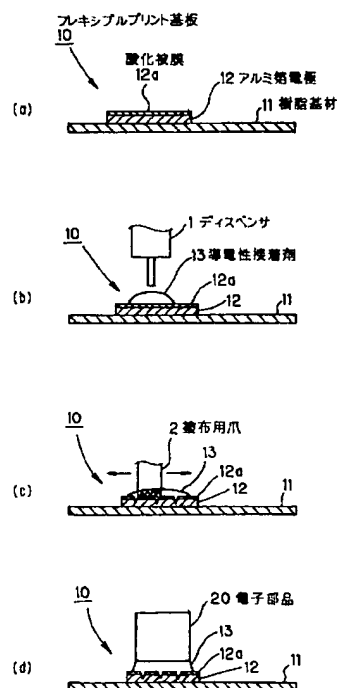
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(54) 【発明の名称】 電子部品接合方法

(57) 【要約】

【課題】 高い柔軟性を有すると共に耐熱性が低い基材にアルミ箔電極を設けた基板であっても、電子部品を接合することができる方法を提供する。

【解決手段】 柔軟性を有すると共に耐熱性が低いポリエチレンテレフタレートなどのような樹脂基材11にアルミ箔電極12を設けたフレキシブルプリント基板10に電子部品20を接合する電子部品接合方法であって、アルミ箔電極12上にディスペンサ1により導電性接着剤13を付着すると同時に、アルミ箔電極12に塗布用爪2を押し付けてアルミ箔電極12の表面の酸化被膜12aを削り取ることにより、アルミ箔電極12の露出した地肌に導電性接着剤13を密着させた後、導電性接着剤13を介してアルミ箔電極12に電子部品20を接合する。



【特許請求の範囲】

【請求項１】 柔軟性を有すると共に耐熱性が低い基材にアルミ箔電極を設けたフレキシブルプリント基板に電子部品を接合する電子部品接合方法であって、前記アルミ箔電極上に導電性接着剤を付着すると同時に、当該アルミ箔電極に塗布用爪を押し付けて当該アルミ箔電極の表面の酸化被膜を削り取って当該アルミ箔電極の露出した地肌を上記導電性接着剤を密着させた後、当該導電性接着剤を介して当該アルミ箔電極に前記電子部品を接合することを特徴とする電子部品接合方法。

【発明の詳細な説明】

【０００１】

【発明の属する技術分野】本発明は、柔軟性を有すると共に耐熱性が低い基材にアルミ箔電極を設けたフレキシブルプリント基板に電子部品を接合する電子部品接合方法に関する。

【０００２】

【従来の技術】従来、電子部品を接合するプリント基板は、ガラスエポキシの基材に銅箔の電極を有するものが主流であったが、コスト低減のため、銅箔の電極に代えて、アルミ箔の電極を用いたものが利用され始めている。銅箔電極は、その表面に生成する酸化被膜による絶縁性が少ないものの、アルミ箔電極は、その表面に生成する酸化被膜による絶縁性が大きいので、電子部品を接合する前に上記酸化被膜を除去する必要がある。

【０００３】具体的には、図２に示すように、ガラスエポキシ基材１１１にアルミ箔電極１１２を設けたプリント基板１１０の当該電極１１２表面に生成した酸化被膜１１２ａを超音波１０１や熱１０２などにより破壊して当該電極１１２の地肌を露出させた後、当該電極１１２の上記地肌に電子部品１２０を密着してハンダ付けて接合している。

【０００４】

【発明が解決しようとする課題】近年、プリント基板のさらなる低コスト化および高フレキシブル化を図るため、ガラスエポキシ基材に代えて、ポリエチレンテレフタレート（ＰＥＴ）などのような樹脂からなる基材を用いることが考えられている。

【０００５】しかしながら、上述したような樹脂基材は、高い柔軟性を有すると共に、耐熱性が低いことから、その上面に設けたアルミ箔電極の酸化被膜を前述したように超音波で破壊しようとしても、アルミ箔電極に超音波エネルギーが伝達せず、また、熱で破壊しようとしても、十分に加熱ができないため、アルミ箔電極の酸化被膜を十分に除去することができず、電子部品の接合が非常に困難となってしまう。

【０００６】このようなことから、本発明は、高い柔軟性を有すると共に耐熱性が低い基材にアルミ箔電極を設けた基板であっても、電子部品を接合することができる方法を提供することを目的とした。

【０００７】

【課題を解決するための手段】前述した課題を解決するための、本発明による電子部品接合方法は、柔軟性を有すると共に耐熱性が低い基材にアルミ箔電極を設けたフレキシブルプリント基板に電子部品を接合する電子部品接合方法であって、前記アルミ箔電極上に導電性接着剤を付着すると同時に、当該アルミ箔電極に塗布用爪を押し付けて当該アルミ箔電極の表面の酸化被膜を削り取って当該アルミ箔電極の露出した地肌を上記導電性接着剤を密着させた後、当該導電性接着剤を介して当該アルミ箔電極に前記電子部品を接合することを特徴とする。

【０００８】

【発明の実施の形態】本発明による電子部品接合方法の実施の形態を図１を用いて説明する。なお、図１は、その手順説明図である。

【０００９】ＰＥＴなどのような樹脂基材１１上にアルミ箔電極１２を設けたフレキシブルプリント基板１０は、アルミ箔電極１２が大気中の酸素で酸化され、当該電極１２の表面が絶縁性の酸化被膜１２ａで覆われているため、そのままでは導電性がなく電子回路を構成することができない（図１（ａ）参照）。

【００１０】そこで、フレキシブルプリント基板１０のアルミ箔電極１２上に導電性接着剤１３をディスペンサ１により付着してアルミ箔電極１２と大気中の空気とを遮断（図１（ｂ）参照）すると同時に、塗布用爪２をアルミ箔電極１２に押し付けて酸化被膜１２ａを削り取り、導電性接着剤１３をアルミ箔電極１２の露出する地肌と密着させて（図１（ｃ）参照）導電性を確保した後、導電性接着剤１３を介してアルミ箔電極１２に電子部品２０を密着させ（図１（ｄ）参照）、導電性接着剤１３を硬化させることにより、アルミ箔電極１２と電子部品２０とを接合する。

【００１１】このようにしてアルミ箔電極１２に電子部品２０を接合すれば、超音波や熱などを用いなくても酸化被膜１２ａを除去することができると共に、露出させたアルミ箔電極１２の地肌の再度の酸化を確実に防止することができるので、高い柔軟性を有すると共に耐熱性が低いＰＥＴなどのような材料からなる樹脂基材１１にアルミ箔電極１２を設けたフレキシブルプリント基板１０でも、電子部品２０を問題なく実装することができる。

【００１２】したがって、このような電子部品接合方法によれば、低コストなフレキシブルプリント基板１０にでも電子部品２０を容易に実装することができるので、様々な電子機器の部品にかかるコストを大幅に削減することができる。

【００１３】また、汎用の自動ボンディング装置に塗布用爪および塗布用アクチュエータを付加するだけで容易に実施することができると共に、自動生産に容易に対応することができるので、設備にかかるコスト上昇幅を抑

えることができると共に、製造効率を低下させることがない。

#### 【0014】

【発明の効果】本発明による電子部品接合方法は、柔軟性を有すると共に耐熱性が低い基材にアルミ箔電極を設けたフレキシブルプリント基板に電子部品を接合する電子部品接合方法であって、前記アルミ箔電極上に導電性接着剤を付着すると同時に、当該アルミ箔電極に塗布用爪を押し付けて当該アルミ箔電極の表面の酸化被膜を削り取って当該アルミ箔電極の露出した地肌に上記導電性接着剤を密着させた後、当該導電性接着剤を介して当該アルミ箔電極に前記電子部品を接合することから、超音波や熱などを用いなくても酸化被膜を除去することができると共に、露出させたアルミ箔電極の地肌の再度の酸化を確実に防止することができるので、高い柔軟性を有すると共に耐熱性が低い基材にアルミ箔電極を設けたフ

レキシブルプリント基板でも、電子部品を問題なく実装することができる。

#### 【図面の簡単な説明】

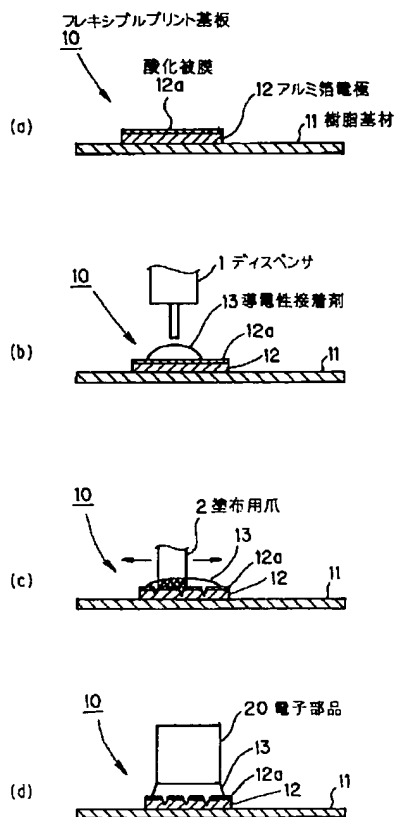
【図1】本発明による電子部品接合方法の実施の形態の手順説明図である。

【図2】従来の電子部品接合方法の説明図である。

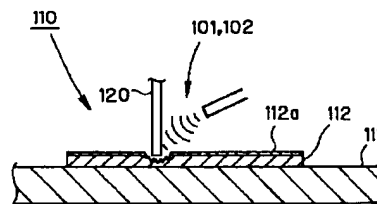
#### 【符号の説明】

- 1 ディスペンサ
- 2 塗布用爪
- 10 フレキシブルプリント基板
- 11 樹脂基材
- 12 アルミ箔電極
- 12a 酸化被膜
- 13 導電性接着剤
- 20 電子部品

【図1】



【図2】



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METHOD FOR JOINTING OF ELECTRONIC COMPONENTS

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PUBLISHED:      February 12, 1999 (19990212)  
INVENTOR(s):    OOTSUBO KIICHIROU  
APPLICANT(s):   MITSUBISHI HEAVY IND LTD  
APPL. NO.:      09-189506 [JP 97189506]  
FILED:          July 15, 1997 (19970715)  
INTL CLASS:     H05K-003/32

#### ABSTRACT

PROBLEM TO BE SOLVED: To provide a method for jointing an electronic components even to a board having a substrate with high flexibility and low heat resistance and having an aluminum foil electrode provided to the substrate.

SOLUTION: In this method, an electronic component 20 is jointed to a flexible printed circuit board, having a resin substrate 11 of polyethylene terephthalate or the like with a high flexibility and a low heat resistance and having an alumina foil electrode 12 provided to the substrate. In this case, a conductive adhesive 13 is applied onto the alumina foil electrode 12 with the use of a dispenser. At the same time as the application, an applying tooth 2 is pushed against the electrode 12 to remove an oxide film 12a on the electrode 12. After the adhesive 13 having been applied tightly onto an exposed bare surface of the electrode 12, the electronic component 20 is jointed to the electrode 12 via the adhesive 13.

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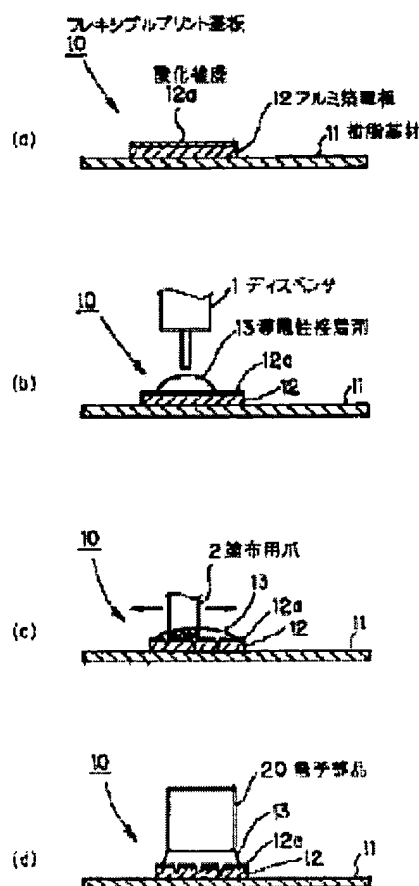
# METHOD FOR JOINTING OF ELECTRONIC COMPONENTS

**Patent number:** JP11040927  
**Publication date:** 1999-02-12  
**Inventor:** OOTSUBO KIICHIROU  
**Applicant:** MITSUBISHI HEAVY IND LTD  
**Classification:**  
 - international: H05K3/32  
 - european:  
**Application number:** JP19970189506 19970715  
**Priority number(s):**

## Abstract of JP11040927

**PROBLEM TO BE SOLVED:** To provide a method for jointing an electronic components even to a board having a substrate with high flexibility and low heat resistance and having an aluminum foil electrode provided to the substrate.

**SOLUTION:** In this method, an electronic component 20 is jointed to a flexible printed circuit board, having a resin substrate 11 of polyethylene terephthalate or the like with a high flexibility and a low heat resistance and having an alumina foil electrode 12 provided to the substrate. In this case, a conductive adhesive 13 is applied onto the alumina foil electrode 12 with the use of a dispenser. At the same time as the application, an applying tooth 2 is pushed against the electrode 12 to remove an oxide film 12a on the electrode 12. After the adhesive 13 having been applied tightly onto an exposed bare surface of the electrode 12, the electronic component 20 is jointed to the electrode 12 via the adhesive 13.



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CLAIMS

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[Claim(s)]

[Claim 1] It is the electronic-parts junction approach which joins electronic parts to the flexible printed circuit board which prepared the aluminum foil electrode in the base material with low thermal resistance while having flexibility. After sticking the above-mentioned electroconductive glue to the natural complexion which forced the pawl for spreading on the aluminum foil electrode concerned, shaved off the oxide skin of the front face of the aluminum foil electrode concerned, and the aluminum foil electrode concerned exposed at the same time it adheres electroconductive glue on said aluminum foil electrode, The electronic-parts junction approach characterized by joining said electronic parts to the aluminum foil electrode concerned through the electroconductive glue concerned.

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DETAILED DESCRIPTION

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[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to the electronic-parts junction approach which joins electronic parts to the flexible printed circuit board which prepared the aluminum foil electrode in the base material with low thermal resistance while having flexibility.

[0002]

[Description of the Prior Art] Conventionally, although what has the electrode of copper foil in the base material of glass epoxy was in use as for the printed circuit board which joins electronic parts, for cost reduction, it replaces with the electrode of copper foil and the thing using the electrode of aluminum foil is beginning to be used. Although a copper foil electrode has little insulation by the oxide skin generated on the front face, since an aluminum foil electrode has the large insulation by the oxide skin generated on the front face, before joining electronic parts, it is necessary to remove the above-mentioned oxide skin.

[0003] As shown in drawing 2, after destroying oxide skin 112a generated on the electrode 112 front face concerned of the printed circuit board 110 which formed the aluminum foil electrode 112 in the glass epoxy group material 111 with a supersonic wave 101, heat 102, etc. and specifically exposing the natural complexion of the electrode 112 concerned, electronic parts 120 were stuck, and it soldered to the above-mentioned natural complexion of the electrode 112 concerned, and has joined to it.

[0004]

[Problem(s) to be Solved by the Invention] In order to attain further low-cost-izing of a printed circuit board, and high flexible-ization in recent years, it considers replacing with glass epoxy group material and using the base material which consists of resin, such as polyethylene terephthalate (PET).

[0005] However, while a resin base material which was mentioned above has high flexibility Since thermal resistance is low and heating is fully impossible, even if ultrasonic energy does not tend to transmit to an aluminum foil electrode even if it is going to destroy ultrasonically, as the oxide skin of the aluminum foil electrode prepared in the top face was mentioned above, and it is going to destroy with heat, The oxide skin of an aluminum foil electrode will not fully be able to be removed, but junction of electronic parts will be very difficult.

[0006] Since it was such, this invention aimed at offering the approach of joining electronic parts, even if it was the substrate which prepared the aluminum foil electrode in the base material with low thermal resistance, while having high flexibility.

[0007]

[Means for Solving the Problem] The electronic-parts junction approach by this invention for solving the technical problem mentioned above It is the electronic-parts junction approach which joins electronic parts to the flexible printed circuit board which prepared the aluminum foil electrode in the base material with low thermal resistance while having flexibility. After sticking the above-mentioned electroconductive glue to the natural complexion which forced the pawl for spreading on the aluminum foil electrode concerned, shaved off the oxide skin of the front face of the aluminum foil electrode concerned, and the aluminum foil electrode concerned exposed at the same time it adheres electroconductive glue on said aluminum foil electrode, It is characterized by joining said electronic parts to the aluminum foil electrode concerned through the electroconductive glue concerned.

[0008]

[Embodiment of the Invention] The gestalt of operation of the electronic-parts junction approach by this invention is explained using drawing 1 . In addition, drawing 1 is the procedure explanatory view.

[0009] Since the aluminum foil electrode 12 oxidizes with the oxygen in atmospheric air and the front face of the electrode 12 concerned is covered by insulating oxide skin 12a, if the flexible printed circuit board 10 which formed the aluminum foil electrode 12 on the resin base materials 11, such as PET, remains as it is, it does not have conductivity and cannot constitute an electronic circuitry (refer to drawing 1 (a)).

[0010] Then, at the same time it adheres electroconductive glue 13 by the dispenser 1 on the aluminum foil electrode 12 of a flexible printed circuit board 10 and intercepts the aluminum foil electrode 12 and air in atmospheric air (refer to drawing 1 (b)) Force the pawl 2 for spreading on the aluminum foil electrode 12, and oxide skin 12a is shaved off. After making it stick with the natural complexion to which the aluminum foil electrode 12 exposes electroconductive glue 13 and securing conductivity (refer to drawing 1 (c)), The aluminum foil electrode 12 and electronic parts 20 are joined by sticking electronic parts 20 to the aluminum foil electrode 12 through electroconductive glue 13 (referring to drawing 1 (d)), and stiffening electroconductive glue 13.

[0011] Thus, since oxidation of the natural complexion of the exposed aluminum foil electrode 12 for the second time can be certainly prevented while oxide skin 12a is removable even if it uses neither a supersonic wave nor heat if electronic parts 20 are joined to the aluminum foil electrode 12, while having high flexibility, electronic parts 20 can be mounted in the resin base material 11 with which thermal resistance consists of ingredients, such as low PET, satisfactory also by the flexible printed circuit board 10 which formed the aluminum foil electrode 12.

[0012] Therefore, according to such an electronic-parts junction approach, since electronic parts 20 can be easily mounted even in the low cost flexible printed circuit board 10, the cost concerning the components of various electronic equipment is sharply reducible.

[0013] Moreover, manufacture effectiveness is not reduced while being able to stop the cost rise width of face concerning a facility, since it can respond to automatic manufacturing easily while being able to carry out easily only by adding the pawl for spreading, and the actuator for spreading to general-purpose automatic bonding equipment.

[0014]

[Effect of the Invention] The electronic-parts junction approach by this invention is the electronic-parts junction approach which joins electronic parts to the flexible printed circuit board which prepared the aluminum foil electrode in the base material with low thermal resistance while having flexibility. After sticking the above-mentioned electroconductive glue to the natural complexion which forced the pawl for spreading on the aluminum foil electrode concerned, shaved off the oxide skin of the front face of the aluminum foil electrode concerned, and the aluminum foil electrode concerned exposed at the same time it adheres electroconductive glue on said aluminum foil electrode, While an oxide skin is removable even if it uses neither a supersonic wave nor heat since said electronic parts are joined to the aluminum foil electrode concerned through the electroconductive glue concerned Since oxidation of the natural complexion of the exposed aluminum foil electrode for the second time can be prevented certainly, while having high flexibility, electronic parts can be mounted in a base material with low thermal resistance satisfactory also by the flexible printed circuit board which prepared the aluminum foil electrode.

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DESCRIPTION OF DRAWINGS

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[Brief Description of the Drawings]

[Drawing 1] It is the procedure explanatory view of the gestalt of operation of the electronic-parts junction approach by this invention.

[Drawing 2] It is the explanatory view of the conventional electronic-parts junction approach.

[Description of Notations]

1 Dispenser

2 Pawl for Spreading

10 Flexible Printed Circuit Board

11 Resin Base Material

12 Aluminum Foil Electrode

12a Oxide skin

13 Electroconductive Glue

20 Electronic Parts

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[Translation done.]